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Six hundred and thirty-sixth Meeting.

October 10, 1871. — MONTHLY MEETING.

The PRESIDENT in the chair.

The President announced the death of Professor Mahan, of West Point, one of the Associate Fellows. He also read a letter from Mr. Kenwood, announcing the donation to the Academy of two books written by him.

Mr. Chauncey Wright read a paper on *Phyllotaxis, or the arrangements of leaves in plants*. This paper will be published in the Memoirs of the Academy.

Six hundred and thirty-seventh Meeting.

November 8, 1871. — STATED MEETING.

The PRESIDENT in the chair.

The Corresponding Secretary read letters from Messrs. Johnson, Lesquereux, Pourtales, and Young, acknowledging their election into the Academy.

The President announced the decease of Sir Charles Babbage, Sir Roderick Murchison, and Fourneyron, all Foreign Honorary Members.

It was voted to grant the request of the American Society of Numismatics to borrow the steel plate of the Rumford Medal, in order to have three hundred copies struck off by Forbes & Co. for the use of that society.

It was voted to authorize the Rumford Committee to sell the remainder of the edition of the Life of Count Rumford, and to contract with an agent for the sale of the new edition of the Works of Rumford.

It was voted to authorize the completion of the second volume of the Works of Count Rumford, at an expense not exceeding \$1000.

The following gentlemen were elected Fellows of the Academy:—

H. G. Denny, of Boston, to be a Resident Fellow in Class III., Section 2.

John Trowbridge, of Cambridge, to be a Resident Fellow in Class I., Section 3.

J. A. Allen, of Cambridge, to be a Resident Fellow in Class II., Section 3.

William H. Pettee, of Cambridge, to be a Resident Fellow in Class II., Section I.

John K. Paine, of Cambridge, to be a Resident Fellow in Class III., Section 4.

Edwin P. Seaver, of Cambridge, to be a Resident Fellow in Class I., Section I.

Professor Benjamin Peirce made a communication on the effect of the consistency of the interior of the earth on the Precession of the Equinoxes. Mr. Hopkins claimed that the effect of the fluidity of the interior would be to render the precession much greater. This view was controverted by Monsieur Delaunay, but sustained by Mr. Pratt. Professor Peirce maintained that, owing to friction, a certain velocity would be imparted to the interior, even if liquid, so that it would produce the same effect as if solid.

Dr. Charles Pickering stated that, having seen the earth's crust forming, he would make a few remarks on the subject :

At the time of his visit to Hawaii there were two lakes of liquid lava at the bottom of the Great Crater ; the larger lake remained always liquid, but the smaller one, "two hundred feet" in diameter, occasionally congealed over. Here is one point gained : for it has been argued, that the material of the Earth, if once entirely fluid, in cooling would contract, become heavier, and sink ; therefore forming a crust is impossible. It is forgotten that a perfectly dry cambric needle can be placed on water so as to float, and for the reason, that it displaces more of the water than its own bulk. So in the irregularities of the earth's surface commonly attributed to the cooling material contracting, we can distinguish a general tendency to concavity, proportionably diminishing and counterbalancing increase in weight.

To return to the smaller lava-lake, when the congealed crust broke up, there was a different state of things. In thickness, this crust seemed six or eight inches ; and back from its edge, usually several feet, a crack would make its appearance, showing a red glow from beneath ;

presently a little liquid lava would ooze forth, and the flow would detach itself, sinking at its outer margin, or seeming to be hurried obliquely downwards under the molten mass. In this manner floe after floe was hurried out of sight, until the molten portion had all around gained the bank.

Professor N. S. Shaler spoke of the effect of changes in the temperature of the moon's surface. Mr. Harrison has shown that this amounts to about 960° F., or from -100° to 840° , assuming the specific heat equal to that of quartz. The effect of such a change on a level plain like the Mare Humorum would be to alter its length half a mile. He proposed to detect such changes by accurate measurements of known points on the moon's surface. So great a variation in temperature would account for the observed alterations of color which have been ascribed to a rapid growth of vegetation.

Professor Benjamin Peirce suggested that these changes in position could be best measured on Mr. Rutherford's photographs of the moon, points near the centre of the disk being selected and measured during the first and last quarter.

Professor E. C. Pickering expressed a doubt whether this method would possess sufficient delicacy, as a variation of one mile would equal only about a second of arc, and the measurements would be complicated by libration, and all the considerations which render so uncertain the moon's diameter.

Professor Benjamin Peirce referred to the Coast Survey steamer now preparing to go to the Pacific for scientific purposes. With a capacity of 350 tons it can make 200 miles a day, while burning less than three tons of coal. Therefore, it can carry enough of the latter for a voyage of 8000 miles. The statement of Dr. Lardner, that no steamer under 500 tons could cross the Atlantic by steam alone, is thus completely disproved, as this vessel could easily make the trip and return without recoaling.